Sharing of Best Practices from an Emergency Medical Team Deployment in Papua New Guinea: Piloting a Health Promotion Program Targeting COVID-19 Vaccine Uptake

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Abstract

Background

COVID-19 tremendously affected Papua New Guinea in late 2021, which accompanied by a low vaccination rate (< 4%), lead to an International Emergency Medical Team (EMT) Request for Assistance. The study’s aim was to assess the knowledge, skills and attitude of health-care workers (HCWs) before and after a workshop conducted by the UK EMT in developing best practices related to Risk Communication and Community Engagement (RCCE) integration within a COVID-19 emergency response.

Methods

A participatory workshop was piloted in Western Highland Province among 71 HCWs. Training of trainers’ approach was adopted to build the capacity of health workers in advocating for vaccines uptake. A perception survey was used at the baseline and at the end of the workshop to assess the knowledge, skills, and attitude of the participants towards COVID-19 vaccine acceptance.

Results

The healthcare professionals were not well equipped with accurate, scientific, and up-to-date information related to COVID-19 vaccines, which led to concern and fear among them. HCWs reported being a source of information for community members about COVID-19 vaccines. The paired t-test showed a significant increase in the knowledge, skills, and attitude of the participants toward COVID-19 vaccines after the workshop. Participants described being ready to engage community influencers and cascade training to further reach out to community groups.

Discussion

Integrating RCCE within EMT deployments plays a crucial role in leveraging healthcare capabilities to influence community members and advocate for COVID-19 vaccines uptake; which will ultimately decrease morbidity and mortality.

Introduction

The effectiveness of vaccination campaigns to combat coronavirus disease (COVID-19) depends on more than just vaccine efficacy and safety. Public health and health-care professionals’ acceptance of vaccines is crucial to the successful control of the pandemic through vaccination. In Papua New Guinea (PNG), similar to other countries, false information and negative perceptions about COVID-19 in general and vaccination in particular has caused delays in vaccination uptake. Studies have shown that vaccine acceptance among health care professionals is problematic. Although the reluctance identified for the COVID-19 vaccine was higher than that seen for vaccines like human papillomavirus (HPV) in 2006 and measles-rubella (MR) in 1963, vaccine hesitancy to a newly released vaccine is not novel and has also been evident with previously introduced vaccines. In PNG, accessibility to accurate information, as well as the lack of continuous professional development of health-care workers (HCWs), are critical issues where the latter should rely on their own personal research to receive the information needed.

Vaccination rates of HCWs appear to have an influence on the overall vaccination rates among Western Highlands communities. The most preferred way for people to receive additional information about COVID-19 vaccination is from HCWs; however, a high number of HCWs indicated that they were not themselves vaccinated and did not intend to get vaccinated. Overwhelmingly, the primary reason given by the HCWs for not getting vaccinated was that the individuals did not believe in vaccines. This would suggest that more awareness and advocacy plans are needed among HCWs to educate them on how vaccines work and why they are an important public health protective measure. One-on-one information sessions about COVID-19 vaccines while involving community influencers such as PNG church leaders should also be endorsed. Again, this would indicate that more attention needs to be given to this group of people so that they will be equipped with the skills, resources, and knowledge to effectively communicate about immunization programs and in particular COVID-19 vaccines.

Although Risk Communication and Community Engagement (RCCE) is a key pillar in a public health emergency response to ensure accurate health information sharing, adoption of protective behaviours by the affected people, and collaborative participation by all stakeholders, including of the local community structures; it is still not well integrated in many national emergency response plans. For instance, the PNG National Control Centre, with the World Health Organization (WHO), have trained HCWs across PNG on clinical practices and infection prevention and control measures but not on health promotion interventions and community engagement programmes.

Emergency medical teams (EMTs) are groups of medical professionals, such as physicians, nurses, paramedics, support staff, and logisticians, who provide care to those affected by emergencies or natural disasters. They come from governments, charities/ nongovernmental organizations (NGOs), the military, civil protection, international humanitarian networks, including the International Red Cross and Red Crescent Movement, Médecins sans Frontières (MSF), United Nations contracted teams and the private-for-profit sector. They deploy fully trained and independent so as not to put further strain on a nation system that is already under pressure, and they operate in accordance with minimal criteria established by the EMT community and its partners. EMTs are often the first responders when a disaster or outbreak hits – deploying immediately to provide high-quality medical care in affected areas. To be able to do this, EMTs must be equipped, trained and coordinated.
Throughout the COVID-19 pandemic, national and international EMTs in the South Pacific have contributed to clinical and public health response efforts. UK-Med, through UK EMT, was deployed to the PNG Western Highlands, after a request for support from WHO due to a high surge in the number of COVID-19 cases. UK EMT was a pioneer in integrating RCCE as a main pillar within their emergency response and incorporated RCCE into its response during the global pandemic. UK-Med has deployed 80 staff over 13 emergency responses in 2021, where RCCE was considered a crucial component across these deployments.

The aim of the study was to assess the knowledge, skills and attitude (KSA) of HCWs before and after they attended a two-day community engagement workshop conducted by UK-Med, on developing best practices related to RCCE integration within a COVID-19 emergency response.

Methods

Study design and sample selection

An exploratory cross-sectional study was conducted in November 2021. Participants were HCWs employed under the Wester Highlands Province of PNG. However, due to the languages barriers, only English speakers were able to participate.

Study instrument and study protocol

The survey instrument was designed based on guidelines, reports, and course materials regarding emerging respiratory diseases including COVID-19 by WHO. An initial draft of the questionnaire was designed, and subsequently validated in two steps. Firstly, the study instrument was sent to researchers and professionals from medical backgrounds (nurses and doctors) to give their expert opinion with respect to its simplicity, language, relativity and importance. Secondly, a pilot study was conducted by asking a small sample of HCWs ($N=20$) for their opinion on making the questionnaire simpler. Participants from health promotion department were selected for the pilot study. A factor analysis was conducted to explore the items that had a good loading in order to be used for the final score. The data from the pilot study was not used in the final analysis.

The survey comprised a demographic section targeting questions related to participants’ sex, age, and job, followed by three sections; eight items assessing the knowledge towards COVID-19 vaccines, seven items assessing practices towards COVID-19 vaccines, and three items assessing the attitude of the HCWs towards COVID-19 vaccines advocacy (Table 1). The scoring used was agree (2), unsure (1), and disagree (0), with a mean score above 1.5 considered as agree.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Practice</th>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covid-19 vaccine is not against God’s will</td>
<td>I usually take the routine immunization for me and my children</td>
<td>I can identify influencers in my community</td>
</tr>
<tr>
<td>I know how Covid-19 vaccine works</td>
<td>I am ready to understand the work of Covid-19 vaccine</td>
<td>I am willing to follow up on the success of community meetings</td>
</tr>
<tr>
<td>I know the importance of vaccines in general</td>
<td>I follow social media to get health information</td>
<td>I am confident that my advocacy plan will succeed, and many people will be vaccinated</td>
</tr>
<tr>
<td>Covid-19 vaccine will not alter my DNA</td>
<td>I follow TV/radio to get health information</td>
<td></td>
</tr>
<tr>
<td>Community is spreading false info about Covid-19 vaccine</td>
<td>I follow news from HCWs to get health information</td>
<td></td>
</tr>
<tr>
<td>Covid-19 vaccine does NOT have 666 or microchip</td>
<td>I am ready to influence other people to take Covid-19 vaccine</td>
<td></td>
</tr>
<tr>
<td>Covid-19 vaccine is safe even it was developed quickly</td>
<td>I am able to organize community meetings to advocate for Covid-19 vaccine</td>
<td></td>
</tr>
<tr>
<td>Covid-19 vaccine is not toxic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The workshop

The workshop was held in Western Highlands, it comprised an introductory session where participants introduced themselves and talked about their concerns and fears, an informative session related to COVID-19 vaccines (What is COVID-19 vaccine? What are the available vaccines? Side effects and effectiveness), how to address rumours and misconceptions, statistics from the Western Highlands Health Authorities, testimonials, and community engagement strategies. The workshop included pitching, role plays, and other interactive activities that guided learners through the process of vaccines advocacy and engaging other community influencers using consistent, accurate, and concise messages. An action plan with clear indicators was set by the participants to be used in their
trainings with other community members and HCWs accordingly. The workshop was delivered by an RCCE specialist along with a physician from the EMT. An evaluation form was completed by the participants at the end of the workshop to assess trainers’ performance and training content.

**Data analysis**

The FACTOR program was used to conduct the exploratory factor analysis to know which items will load on the knowledge, skills and attitude scores to compute their totals. Cronbach’s alpha was used to assess reliability of the scores. The three mean scores of knowledge, skills, and attitude showed to be normally distributed by calculating the skewness and kurtosis values that range between −2 and +2 that are considered acceptable in order to prove normal univariate distribution. Descriptive analysis and the paired t test was used to: (1) describe the characteristics of participants and (2) compare knowledge, skills, and attitude of participants before and after the workshop. A P value of < 0.05 was considered statistically significant. SPSS SS software v.22. was used for data analysis.

**Results**

**Descriptive results**

Seventy-one HCWs participated in the workshop; the mean age was 45 (SD = 7.7), 41% were female and 59% were male.

In the initial survey, the participants had a low level of knowledge regarding the vaccines, especially how they worked (30%), the impact on DNA (65% believed that it will affect their DNA), and the safety of the vaccines (13% thought that COVID-19 vaccines were toxic). The level of knowledge increased after the workshop, where more than 90% were aware of how vaccines function, knew they did not affect their DNA, that they are not toxic, do not contain microchips, and they were not against God's will. However, around 30% of the participants still believed that the vaccines were against their religious beliefs (Fig. 1).

The practices reported by the participants before the workshop did not change directly after the workshop (Fig. 2). However, attendees reported being ready to influence other community members, mobilize their communities, and organize community meetings to advocate for COVID-19 vaccine uptake.

The attitude of participants regarding identifying influencers in their communities increased by 20% after the workshop, as did the willingness to follow-up on the success of community meetings (Fig. 3). The workshop gave the participants the confidence to correct misinformation and rumours by 50%. After the workshop, participants reported an increase by 40% in higher confidence in organizing advocacy plans related to COVID-19 vaccines as they learned the techniques of advocacy and action-plans settings. When participants were asked whether they are considered as trustworthy within their communities, all of them agreed.

**Factor analysis**

The loading factors of each knowledge, skills and attitude items on the total factor are summarized in a supplementary document. The remaining items were removed because of low communality (< 0.3).

**Comparison of the knowledge, skills and attitude scores before and after the workshop**

The paired t-test showed a significant increase in the knowledge and attitude of participants, but not skills (Table 2).

<table>
<thead>
<tr>
<th></th>
<th>Mean ± SD Before</th>
<th>t</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>0.71 ± 0.14</td>
<td>1.92</td>
<td>70</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Skills</td>
<td>1.93 ± 0.19</td>
<td>1.89</td>
<td>1.79</td>
<td>0.078</td>
</tr>
<tr>
<td>Attitude</td>
<td>1.76 ± 0.22</td>
<td>1.95</td>
<td>6.02</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**Evaluation of the workshop**

All participants mentioned that it was an excellent training in terms of trainers’ performance and content. One 39-year-old female stated, 'The training is interesting and informative, it cleared some doubts and it enhanced my ability to respond to a lot of questions and to correct a lot of misinformation', while a 44-year-old male stated, 'This is the best training for RCCE to influence community members, the messages are clear and we are able to clear misinformation'.

**Discussion**

The results of the pre-test post-test study showed that the RCCE workshop for healthcare professionals enhanced their knowledge and skills needed to advocate for COVID-19 vaccines uptake. Moreover, it also increased their readiness to mobilize community influencers and lead other community engagement trainings; hence, strengthening the response by the local health leaders and community members.

In our study, 45% of the respondents were initially hesitant to be vaccinated for COVID-19. This is the opposite to that reported in Italy, where less than 6.6% of the HCWs interviewed were unwilling to take COVID-19 vaccines. Globally, the prevalence of COVID-19 vaccination hesitancy among HCWs is not uniformly
diffused, varying from 4.3–72%; this hesitancy is mainly affected by the spread of misinformation in specific contexts.\textsuperscript{13} Our study showed that hesitancy was linked to misinformation among the participants.

An infodemic can pose a serious threat and cause panic in society by disseminating false and incorrect information, as was seen in the COVID-19 pandemic, even among HCWs. During epidemics, timely, accurate, and authentic information is crucial in forming public opinion.\textsuperscript{14} Our study demonstrated the urgent need for implementing RCCE intervention to equip healthcare professionals with up-to-date information in addition to clinical assistance which was suggested by WHO country office in PNG.\textsuperscript{5} Many healthcare professionals in developing nations have limited or no access to basic knowledge about vaccination. This may be due to several factors, including unequal distribution of internet connectivity, and the tendency for using internet-based approaches for training health professionals rather than using other approaches essential to primary and district health workers such as in person professional development and capacity building.\textsuperscript{15}

There is an urgent need to address any apprehensions regarding COVID-19 vaccines. A tailored and intensified advocacy program for HCWs is needed before and during the launch of vaccines.\textsuperscript{3} Despite demands placed on public health to meet new and future challenges, skill, deficits in the public health workforce are evident and include insufficient preparation via education and training for the jobs performed. These gaps are documented in areas corresponding to key competencies, including the use of evidence in decision making (e.g. communicating with policymakers, engaging community in decision making process, evaluation designs, and adapting interventions).\textsuperscript{16}

Therefore, capacity-building interventions can enhance knowledge, skill, self-efficacy (including confidence), changes in practice or policies, behaviour change, application, and system-level capacity. The findings of this study showed the critical need for two main health promotion interventions: information and knowledge capacity building, and communication and advocacy skills and techniques. A similar capacity building initiative conducted in Africa by WHO and the local government in Namibia to better prepare HCWs to respond to COVID-19 also showed a positive impact in enhancing HCW abilities to respond to this public health emergency. WHO called for similar actions across the globe to mitigate the negative consequences of such crises.\textsuperscript{17}

By increasing and maintaining human and organizational capacity to address local health challenges, this form of intervention aims to strengthen public health practitioners' practice and the infrastructure of public health organizations.\textsuperscript{18} Beyond the education necessary to acquire public health credentials, it involves future planning, systems that can handle peak capacity, and ongoing training.\textsuperscript{19} Providing technical assistance, in-depth consultations, virtual and in-person training sessions, online learning options, guidance materials in the form of knowledge products, and skills-based courses are just a few examples of the many different ways that capacity building interventions can be implemented.\textsuperscript{19} While it is widely agreed that many high-income nations are becoming better at promoting health, particularly in terms of organizational development and infrastructure, the situation in many low- and middle-income countries is still unclear. While many nations may not have abundant financial and natural resources, they may have plenty of people and community resources, which may be used to develop their capacities. One of the key challenges, therefore, becomes how this key resource of people can be mobilised, skilled and supported to deliver on health promotion,\textsuperscript{20} which is the case in Papua New Guinea. Therefore, our piloted community engagement workshop might be a good example to enable health promoters to reach out to community influencers, build their capacities, and engage them in advocacy plans and actions. This study had some limitations. The workshop was conducted among 71 HCWs only, replicating this program in other countries or with a larger number of HCWs might provide more accuracy in assessing the effectiveness of the community engagement workshop. Also, due to the small sample size, we were not able to have a higher Cronbach alpha. Finally, participants who did not have a basic English knowledge were excluded.

**Conclusion**

RCCE interventions are important for any emergency response plan as they play a role in decreasing morbidity and mortality. It is essential for the EMT to promote this emergency response pillar. Integrating RCCE within EMT deployments can leverage HCWs’ capabilities in influencing community members and advocating for public health interventions, including COVID-19 vaccines uptake. Further research is required to strengthen the role of RCCE in emergencies, and best practices should be shared among other EMTs to be replicated and adapted to specific contexts during emergencies.

**Abbreviations**

HCW: Health Care Workers  
WHO: World Health Organization  
EMT: Emergency medical teams  
RCCE: Risk Communication and Community Engagement

**Declarations**

- Ethics approval and consent to participate: Was taken from the IRB- MU20211001-38 Modern University for Business and Science MUBS- Participants consented their participation in this health promotion intervention.  
- Consent for publication: All authors consent the publication  
- Availability of data and materials: Are available with the authors- and available upon request  
- Competing interests: NO conflict of interest
Funding: FCDO

**Authors’ contributions:**

- Ramnath Vadi: overview of the implementation of the programs and tools validation, revision of the manuscript
- Lizzi Marmot: Support the implementation of the program
- Souheil Hallit: Data analysis and revision
- Mariam Mohammad: Editing and revision of manuscript
- Diana Maddah: Designing, conducting, implementation, analysis of the data and manuscript writing.

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**References**

Figures

Figure 1

Answers to the knowledge questions before and after the workshop

Figure 2

Practice scores before and after the workshop

Figure 3

Positive attitude before and after the workshop